## Operational User Support (OUS) Manifesto
A White Paper for the Strategic Evolution of ESE Data Systems (SEEDS) Public Workshop
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One of the key elements to be discussed at the public workshop is cost modeling and levels of service. Operational user support (OUS), e.g. on-line information, help desk, tutorials, and chat rooms, is one of the levels of service that tends to be an afterthought in software system designs, operational concepts, and budgets though the benefits of incorporating OUS may yield system cost savings and user satisfaction that outweighs the implementation costs. The position of this paper is to urge incorporation of OUS considerations into system design, data processing, applications development, and operations planning and budgeting.

By way of a partial example, the current ESIP Federation data system OUS functions, are a labor-intensive process and one of the common functions for Earth science web-based information providers. The differences among various implementations of (in this case) help desk functions within the ESIP Federation include:
- Ability of existing helpdesk infrastructure to handle varying levels of user traffic
- The number and frequency of new data sets, products and services offered
- The type, size and sophistication of the community supported
- Size of help desk budgets to provide necessary support
- Whether users pay for data and services (better service expected)
- How user support information is developed, updated and distributed, and
- The mechanisms for obtaining user feedback during the product/service development stages

As each provider releases products and services associated with their Earth science activities via the web, it is necessary (mandatory?) to provide an appropriate level of support to users who, e.g., search, browse, sub-set, download and analyze data sets.   The appropriate OUS level seems to be a function of what the individual organization can afford in terms of funding and FTE when the subject arises, not because it was considered a high priority earlier.

As data and services providers upgrade, enhance, renovate or re-create their several systems, they need to consider what techniques to use for handling user issues in a simple, minimum effort manner.

In this author's opinion, the first step is to **gain agreement of a complement of guidelines** among all providers who plan to participate in the SEED evolution such as:

1. Level of OUS services provided over the life cycle of the products provided will include, e.g.
   a. Known processing protocols
   b. A minimum set of metadata
   c. Hyperlinked OUS levels and categories
   d. FAQ availability
   e. Maintenance of access URLs (i.e. seamless passing of a user from an outdated URL to the latest one)
   f. Enhancement/Evolution plan schedule
2. Where the OUS interfaces are between primary data provider and the value-added products providers
   a. DAACs provide OUS for standard products
   b. Providers support the life cycle from Level 1b data ingest to beneficial product use by consumers
3. Designed in techniques for e.g. tracing data sources, metadata per data set, processing protocols used, etc.

It is suggested that a working group be formed to mentor creation of a set of Provider Guidelines for incorporation into any provider contract. These will serve as SEEDS standards for user services.

A second step involves **Design and Implementation**.

Assume that the user-help-desk process must address data, software, and related issues and then be able to:
1. answer user questions quickly
2. guide users toward solutions that are self-initiated or aided by the project
3. exercise administrative control to prevent loss of data, system failures, inaccurate information
4. record the user issue(s) raised for assessment later
5. surface data, information product, and related issues for resolution later

Potential solutions range from a boot strap, self-supporting, community approach to total hand-holding with an army of help desk technicians, data administrators, and access to scientists. However, e.g. if data format translators are readily available to users, if security protocol options are offered, if Frequently Asked Questions sections are available and kept up to date and if hand off responsibilities are known among the products, OUS support can perform its functions better. Designing functionality that enables user support to be provided in a practical and cost effective way, is a strong benefit to ultimate system utility, in my opinion. Note that with multiple data centers, providing diverse services, lines of responsibility with respect to user support appears critical. If one adds other value-added providers to the mix, the potential for user support problems may be unacceptable.

The third step is **operational planning and associated budgeting**. User support is more than providing knowledgeable people 24/7; it is providing users, on-line resources that avoid the need of Help Desks, except for exotic challenges, and providing the help desk staff with the required tools and resources to provide the proper answers. The trade off is to determine the cost benefits of what built-in functionality is necessary versus providing updated documentation and proper tools to OUS staffers at acceptable costs.

Several current projects exist that can provide a test bed for assessing, under controlled circumstances, alternative approaches to operational user support. They can help answer, for example, what functions may be centralized in whole or in part versus which ones must be tied only to a specific user community.

In NASA's Earth Science Information Partner program, ESIP 2 (science and relevant technology) and ESIP 3 (Earth science application commercialization) participants service a variety of user communities from sophisticated scientific researchers (i.e. weather prediction, variability and modeling) to support for commercial fishermen's search for fish. OUS approaches are unique for each ESIP. Under the ESIP Federation, and the emerging ESIP Foundation, prototype projects can be readily developed to validate or eliminate alternate OUS implementation approaches.

In a second NASA supported project example, Virginia Access (VAccess), the user community is local, regional and state level natural resource agencies and organizations. They require support in the use of remote sensing data merged as layers with their GIS systems that includes prototyping information products, providing decision support resources, educating staff in advanced technology and how the products apply to their challenges. User support in this context is vastly different from the prior example.

A possible fourth step is capturing **metrics** in such a way that user support can be improved via detecting real system problems early, measuring user satisfaction with the products and services offered, and identifying possible new products. Quantitative metrics may be effective in measuring how the system is theoretically performing, whereas up-to-date qualitative assessments are annoying to the users and costly to collect. The one lesson learned in this context is from the University of Delaware. They established a **guestbook** that is optional whenever a user logs on, but requires contact information and optional comments on expected use when data is downloaded or used in products and services that they are planning.

The guestbook provides insights into new, alternate and, in some cases, highly innovative uses of the data sets offered. In addition, in rare cases, opportunities are identified to combine efforts and create a product/service that is more valuable than the un-coupled products might be.